

Churn Analytics

Low Level Design (LLD)

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DOCUMENT VERSION CONTROL

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1. Introduction

1.1 What is Low-Level Design Document?

The Low-Level Design Document (LLD), also known as an LLDD, aims to provide the core logic design of the actual computer code for the dashboard. Class diagrams with methods and relationships between classes and programme specifications are described using LDD. In order for the programmer to create the programme directly from the document, it describes the modules.

1.2 Scope

Low-Level Design is a component level design process that uses a sequential process of refinement. Data structures, necessary software architecture, source code and finally performance algorithms can all be designed using this method. Overall, during requirement analysis, the data organization may be created and then refined during data design work.

2. Architecture



Source: <https://towardsdatascience.com/fundamentals-of-data-architecture-to-help-data-scientists-understand-architectural-diagrams-better-7bd26de41c66>

3. Description

3.1 Problem Statement

A business is dealing with client attrition. The main goal is to precisely evaluate the customers' churning rate and churned customers count and the factors responsible for it in order to help the business gain insights into the services that it needs to improve.

3.2 Data Collection

The dataset of the company is provided in the form of Excel workbook.

3.3 Data Description

The dataset contains the following columns:

- Agency
- Commendation or Complaint
- Subject Matter
- Subject Detail
- Issue Detail
- Year
- Quarter
- Branch/Line/Route

3.4 Data Transformation

The null values of the Issue Detail column have been replaced by the 'Unspecified' text. The duplicate entries are removed. In this way, the data has been cleaned.

3.5 Deployment

The Customers' Churn Analytics Dashboard created:

Customers Churn Analysis

95.38%
Churning Rate

Churned Customers Count



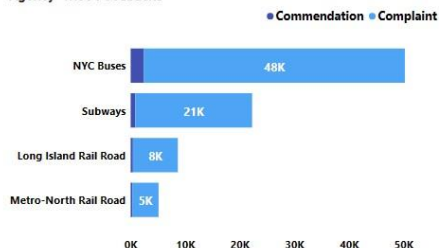
Year

2014	2016
2015	2017

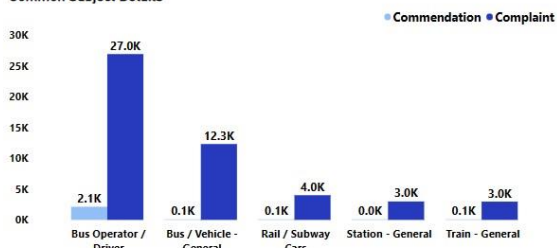
Quarter

1	3
2	4

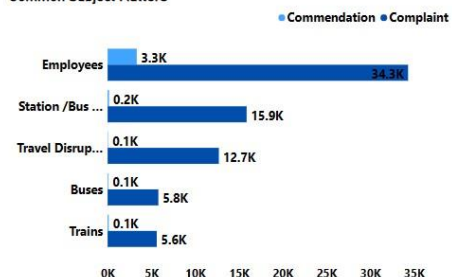
Agency-wise Feedbacks



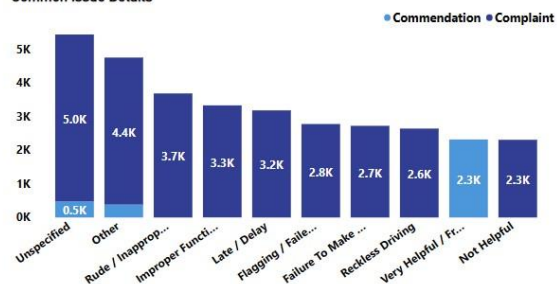
Common Subject Details



Common Subject Matters



Common Issue Details



The various SQL query results are as follows:

Churning_Rate_of_Customers
▶ 95.38%

Churned_Customers_Count
▶ 82231

Retained_Customers_Count
▶ 3984

	Quarter	Count_of_Customers
▶	3	23814
	4	23705
	2	18176
	1	16536

	Year	Count_of_Customers
▶	2017	9502
	2016	28302
	2015	35455
	2014	12956

	Agency	Agency_Count
▶	NYC Buses	47781
	Subways	21401
	Long Island Rail Road	8231
	Metro-North Railroad	4818

	Subject_Matter	Count_of_Customers
▶	Employees	34314
	Station /Bus Stop /Facility /Structure	15876
	Travel Disruption / Trip Problem	12704
	Buses	5795
	Trains	5613
	Telephone / Website / Mobile Apps	2258
	Policies, Rules & Regulations	2111
	Schedules / Reservations	1376
	MetroCard/Tickets/E-Zpass & Tolls	1346

	Subject_Detail	Count_of_Customers
▶	Bus Operator / Driver	26957
	Bus / Vehicle - General	12335
	Rail / Subway Cars	4015
	Station - General	2994
	Train - General	2974
	Train Conductor	2453
	Platforms	2016
	Ticket Machines	1842
	No Value	1666

	Issue_Detail	Count_of_Customers
▶	Unspecified	4963
	Other	4373
	Rude / Inappropriate Language	3689
	Improper Function/Needs Repair/Damaged	3329
	Late / Delay	3185
	Flagging / Failed To Stop	2779
	Failure To Make Scheduled Stop	2726
	Reckless Driving	2644
	Not Helpful	2310

3.6 Insights

- The customers' churning rate is very high i.e. 95.38 %. The company may face a huge loss, if it doesn't tackle the problem on urgent basis.
- The NYC Buses agency has the maximum number of complaints, followed by Subways. These agencies are not providing good services to the customers.
- Mostly customers are disappointed with the Employees and Station/Bus Stop/Facility/structure services. These need to be tackled in order to decrease the churning rate of customers.
- Mostly customers face problems with the Bus Operator or Driver and Vehicles.
- Specifically, the customers get bothered by the rude behaviour or inappropriate language used by the drivers and malfunctioning of the vehicles, other than the reasons unspecified. The company should seriously take action against such drivers and also repair the malfunctioned vehicles in order to increase the customer retention rate.
- It is clear that the customers are not liking the services since year 2015 as the number of customers starts decreasing since year 2015. The number of customers drastically decreases in the year 2017.
The customers count in the year 2017 became even lesser than half of the count in the year 2016. The maximum churning of customers has taken place in the year 2017.
- The maximum churning of customers has taken place in the 3rd and 4th quarters (approximately 25% in each quarter).

4. Unit Test Cases

TEST CASE DESCRIPTION	EXPECTED RESULTS
Agency-wise Feedbacks	The chart provides the distribution of complaints and commendations in different agencies.
Common Subject Matters	The chart depicts the common subject matters of the customers.
Common Subject Details	The chart displays the common subject details of the customers.
Common Issue Details	The chart shows the common issue details of the customers.
Customers' Churning Rate	This KPI indicates the rate at which the customers are churning from the business.
Churned Customers Count	This KPI indicates the count of churned customers.